

Claims

What is claimed is:

- Sub A4
1. A method of routing traffic between first and second nodes in a network so as to provide protection against network failures, the method comprising the steps of:
    - 5 routing units of traffic on corresponding sets of trunks connected between the first and second nodes such that the traffic is balanced between disjoint paths; and
    - implementing a restoration process for the traffic utilizing at least one of a service layer switching and transport layer switching.
  - 10 2. The method of claim 1 wherein each one of the first and second units of traffic comprise OC-x units of traffic.
  3. The method of claim 1 wherein the service layer switching process comprises a packet-based switching process.
  - 15 4. The method of claim 1 wherein the service layer switching process comprises an Internet protocol (IP) switching process.
  5. The method of claim 1 wherein the first and second nodes are connected by first and second sets of trunks, each of the sets of trunks including multiple trunks, with each of the trunks in a given set of trunks supporting a designated portion of a given one of the units of traffic
  - 20 6. The method of claim 5 wherein the units of traffic are routed such that a first half of a given one of the units of traffic is routed on a first one of the trunks in a given one of the sets of trunks, and a second half of the given unit is routed on a second one of the trunks in the given set of trunks.
  - 25 7. The method of claim 6 wherein the restoration process is implemented using service layer switching.

8. The method of claim 1 wherein the first and second nodes are connected by first and second sets of trunks such that the nodes and sets of trunks form a four-trunk ring, wherein each of the first and second sets of trunks includes a primary trunk and a backup trunk.

5 9. The method of claim 8 wherein a given one of the units of traffic is routed on one of an upper or lower portion of the ring.

10 10. The method of claim 9 wherein the given unit of traffic is split equally between the primary trunk and the backup trunk associated with the upper or lower portion of the ring.

11. The method of claim 9 wherein the given unit of traffic is routed entirely on the primary trunk associated with the upper or lower portion of the ring.

12. The method of claim 8 wherein the ring comprises an IP/optical hybrid ring, and the restoration process is implemented using service layer switching.

13. The method of claim 8 wherein the ring comprises a SONET/optical ring, and the restoration process is implemented using transport layer switching.

14. The method of claim 13 wherein the first and second nodes comprise add-drop multiplexers connected by the sets of trunks, each of the add-drop multiplexers also being coupled to a corresponding router.

15. The method of claim 1 wherein the units of traffic are routed between the first and second nodes so as to provide an opportunity to implement an enhanced quality of service (QoS) for at least one of the units of traffic.

16. An apparatus for routing traffic in a network so as to provide protection against network failures, the apparatus comprising:

first and second network nodes connected by sets of trunks, wherein units of traffic are each routed on a corresponding one of the sets of trunks such that the units of traffic are balanced between disjoint paths between the first and second nodes, the first and second nodes further being configured to implement a restoration process for the traffic utilizing at least one of a service layer switching and transport layer switching.

17. An apparatus for routing traffic in a network so as to provide protection against network failures, the apparatus comprising:

a first network node, the first node being connectable to at least a second network node by sets of trunks, wherein units of traffic are each routed on a corresponding one of the sets of trunks such that the units of traffic are balanced between disjoint paths between the first and second nodes, the first node further being configured to implement at least a portion of a restoration process for the traffic utilizing at least one of a service layer switching and transport layer switching.